CLAIMS

1. A method to derive information regarding one or more bone parameters from an image comprising:

(a) obtaining an image comprising bone from a subject;

(b) defining two or more regions of interest (ROIs) in the image; and

(c) analyzing a plurality of positions in the ROIs to determine one or more parameters selected from the group consisting of bone microarchitecture, bone macro-anatomy, biomechanical parameters and combinations thereof of the ROIs.

2. The method of claim 1, wherein the ROIs are overlapping.

3. The method of claim 1, wherein the positions analyzed in the ROIs are at regular intervals in the image.

4. The method of claim 1, wherein the positions analyzed in the ROIs are at irregular intervals in the image.

5. The method of claim 1, wherein the parameter is bone micro-architecture and the positions analyzed are at regular intervals.

6. The method of claim 1, wherein the parameter is bone macro-anatomy and the positions are analyzed are at irregular intervals in the image.

7. The method of claim 1, wherein the image is two-dimensional.

8. The method of claim 7, wherein image is an x-ray image.

9. The method of claim 1, wherein the image is three-dimensional.

10. The method of claim 1, wherein the image is an electronic image.

11. The method of claim 1, wherein the subject is an osteoporosis subject.

12. A method of generating a map of one or more bone parameters, comprising

(a) obtaining information on bone parameters according to the method of claim 1; and

(b) identifying regions of the image that exhibit similar parameter characteristics, thereby creating a parameter map of the image.

13. A method of predicting a fracture path in a subject, comprising:

(a) generating multiple parameter maps according to the method of claim 12;

(b) generating a composite parameter map from the multiple parameters maps of step (a); and

(c) analyzing the composite parameter map to identify possible fracture paths.

14. A method of predicting a fracture path in a subject comprising:

(a) analyzing one or more parameter maps preparing according to the method of claim 12, wherein the analysis is watershed segmentation analysis or Markov random field analysis; and

(c) identifying possible fracture paths based on the analysis of step (a), thereby predicting a fracture path in the subject.

15. A method of predicting the risk of fracture in a subject comprising:

(a) generating a finite element model from one or more parameter maps obtained according to the method of claim 12;

(b) applying simulated force vectors that would occur during a fracture incident to the finite element model generated in step(s); and

(c) determining the minimum forces required for fracture to occur, thereby estimating the risk of fracture.

16. A method of determining the risk of fracture in a subject comprising:

(a) predicting a fracture path according to the method of claim 13;

(b) evaluating one or more selected bone parameters along the predicted fracture path, thereby estimating the risk of fracture.

17. A method of determining the risk of fracture in a subject comprising:

(a) predicting a fracture path according to the method of claim 14;

(b) evaluating one or more selected bone parameters along the predicted fracture path, thereby estimating the risk of fracture.

18. A method of treating a subject with bone disease comprising

(a) obtaining an image from a subject;

(b) analyzing the image obtained in step (a) as described in claim 1;

(c) diagnosing a bone disease based on the analysis of step (b); and

(d) selecting and administering a suitable treatment to said subject based on said diagnosis.